

Lunar Soil Particle Separator, Phase I

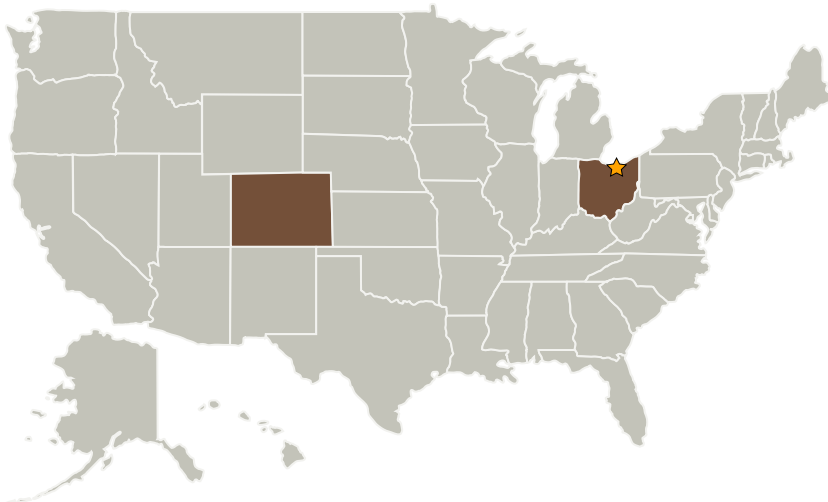
Completed Technology Project (2009 - 2009)



Project Introduction

The Lunar Soil Particle Separator (LSPS) is an innovative method to beneficiate soil prior to in-situ resource utilization (ISRU). The LSPS improves ISRU oxygen yield by boosting the concentration of ilmenite or other iron-oxide bearing materials found in lunar soils. LSPS particle size separations can be performed to improve gas-solid interactions and reactor flow dynamics. LSPS mineral separations can be used to alter the sintering characteristics of lunar soil. The LSPS can eventually be used to separate and concentrate lunar minerals useful for manufacture of structural materials, glass, and chemicals. The LSPS integrates an initial centrifugal particle size separation with magnetic, gravity, and/or electrostatic separations. The LSPS centrifugal separation method overcomes the reduced efficiency of conventional particle sieving in reduced gravity. Feed conditioning, such as charge neutralization, can be incorporated into the LSPS to release and disperse surface fines prior to particle separations. The conceptual LSPS hardware design integrates many individual unit operations to reduce system mass and power requirements. The LSPS is applicable to ISRU feed processing as well as robotic prospecting to characterize soils over a wide region on the Moon. The LSPS is scalable and is amenable to testing and development under simulated lunar environmental conditions.

Primary U.S. Work Locations and Key Partners



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Organizational Responsibility

Responsible Mission Directorate:

Space Technology Mission Directorate (STMD)

Lead Center / Facility:

Glenn Research Center (GRC)

Responsible Program:

Small Business Innovation Research/Small Business Tech Transfer

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Organizations Performing Work	Role	Type	Location
★ Glenn Research Center(GRC)	Lead Organization	NASA Center	Cleveland, Ohio
Pioneer Astronautics	Supporting Organization	Industry Historically Underutilized Business Zones (HUBZones)	Lakewood, Colorado

Primary U.S. Work Locations

Colorado	Ohio
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Project Management

Program Director:

Jason L Kessler

Program Manager:

Carlos Torrez

Technology Areas

Primary:

- TX07 Exploration Destination Systems
 - └ TX07.1 In-Situ Resource Utilization
 - └ TX07.1.2 Resource Acquisition, Isolation, and Preparation